



TCL 集团多媒体电子事业本部  
研发中心

文件编号: QP7.3-F01-2002.1

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# 新规格物料 ☒ 认可书 / ☐ 取消认可书

编制日期: 2007-05-28

序号: S2007-05-195

物料编号: <u>4A-LCD40T-SS3</u> 适用机型: <u>LCD40M71D</u>	
物料名称: <u>三星 40 寸 120Hz 液晶屏</u> (属于: <input checked="" type="checkbox"/> 战略部品 <input type="checkbox"/> 方案部品 <input type="checkbox"/> 通用部品)	
供应商: <u>三星</u> 供应商物料编号: <u>LTA400WH-L01</u>	
供应商代码: _____ 送样部门: _____ 送样人员: _____ 送样日期: _____	
<b>认可原因:</b> <input checked="" type="checkbox"/> 新物料 <input type="checkbox"/> 降低成本 <input type="checkbox"/> 技术指标改善 <input type="checkbox"/> 更换供应商 <input checked="" type="checkbox"/> 试产用途 (试产时间: <u>07-6-20</u> 试产数量: <u>40</u> )	<b>供应商确认状态:</b> <input type="checkbox"/> 已确认 <input type="checkbox"/> 未确认 (供应商未确认时, 应填写下列各项: )  供应商评审人员: _____ 评审时间: _____ 确认供应商批准人员: _____ 批准时间: _____
<b>认可意见及资料:</b> 1) 该物料: ① <input type="checkbox"/> 认可 ② <input checked="" type="checkbox"/> 有条件认可, 数量为 <u>40 件</u> ③ <input type="checkbox"/> 不认可 2) 有效日期: _____ 3) 附送资料: <input type="checkbox"/> 说明书 <input type="checkbox"/> 纸质图纸 <input checked="" type="checkbox"/> 电子版图纸 (yfzls@tcl.com ) <input type="checkbox"/> 环保部品 附部品原材料清单 <input type="checkbox"/> 禁用物质检测报告 4) 附送样板: <input type="checkbox"/> 有样板 <input checked="" type="checkbox"/> 无样板, 到货后补样板	<b>取消认可意见及资料:</b> 1) 产品升级, 向下兼容, 则原有物料编号消; 2) 新品淘汰, 不再使用; 3) 降低成本, 不再使用; 4) 供应商停产; 5) 不符合标准化要求取消。
<b>测试内容及说明:</b> 此屏为 40 寸 120Hz 三星屏, 需经试产确认没有性能问题后才自动转为批量认可。	<b>取消说明:</b> 1) 现有库存: <u>      </u> 2) 所应用的产品型号 (个数): _____ 3) 物料编码作废时间: _____
<b>认证次数:</b> 测试: <u>易山珍</u> 日期: <u>2007.5.28</u> 审核 (各产品所所长): <u>廖浩强</u> 日期: <u>5.28</u> 确认 (部品部): <u>廖浩强</u> 日期: <u>6.14</u> 商务确认 (商务企划部 <input type="checkbox"/> 财务部 <input type="checkbox"/> 显示器件材料部 <input type="checkbox"/> ): _____ 日期: _____ 批准: <u>廖浩强</u> 日期: _____	<b>取消认可审批:</b> 拟制: _____ 日期: _____ 审核 (各产品所所长): _____ 日期: _____ 确认 (部品部): _____ 日期: _____ 批准: _____ 日期: _____



ELECTRONICS

## Product Information

Customer : Proview

DATE : 09.Apr.2007

**SAMSUNG TFT-LCD****MODEL : LTA400WH-L01**

Any Modification of Specification is not allowed without SEC's Permission.

NOTE :

APPROVAED BY <i>Kyunghwan Ko</i>	DATE 09.Apr.2007	PREPARED BY <b>Yong Sun Kim</b>	DATE 09.Apr.2007
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LCD Business

Samsung Electronics Co . , LTD.

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**\* Revision History**

Date	Rev. No	Page	Summary
Apr 09, 2007	06.000	all	First issued

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## General Description

### Description

LTA400WH-L01 is a color active matrix liquid crystal display (LCD) that uses amorphous silicon TFT (Thin Film Transistor) as switching components. This model is composed of a TFT LCD panel, a driver circuit and a back light unit. The resolution of a 40.0" is 1366 x 768 and this model can display up to 16.7 million colors with wide viewing angle of 89° or higher in all directions. This panel is intended to support applications to provide a excellent performance for Flat Panel Display such as Home-alone Multimedia TFT-LCD TV, Display terminals for AV application products, and High Definition TV (HDTV).

### Features

- RoHS compliance (Pb-free)
- High contrast ratio, high aperture ratio, fast response time
- SPVA (Super Patterned Vertical Align) mode
- Wide viewing angle ( $\pm 178^\circ$ )
- High speed response
- WXGA (1366 x 768 pixels) resolution (16:9)
- Low Power consumption
- Direct Type 16 CCFTs (Cold Cathode Fluorescent Tube)
- DE (Data Enable) mode
- LVDS (Low Voltage Differential Signaling) interface (2pixel/clock)

## General Information

Items	Specification	Unit	Note
Module Size	952.0(H <sub>TYP</sub> ) x 551.0(V <sub>TYP</sub> )	mm	$\pm 1.0\text{mm}$
	51.8(D <sub>MAX</sub> )		
Weight	11,000(Max.)	g	
Pixel Pitch	0.648(H) x 0.216(W)*3	mm	
Active Display Area	885.168(H) x 497.664(V)	mm	
Surface Treatment	Haze 44% , Hard-coating (3H)		
Display Colors	8 bit - 16.7M	colors	
Number of Pixels	1366 x 768	pixel	
Pixel Arrangement	RGB vertical stripe		
Display Mode	Normally Black		
Luminance of White	500 (Typ.)	cd/m <sup>2</sup>	

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## 1. Absolute Maximum Ratings

If the condition exceeds maximum ratings, it can cause malfunction or unrecoverable damage to the device.

Item		Symbol	Min.	Max.	Unit	Note
Power Supply Voltage		$V_{DD}$	GND-0.5	16.5	V	(1)
Storage temperature		$T_{STG}$	-20	60	°C	(2)
Glass surface temperature (Operation)	Center	$T_{OPR}$	0	50	°C	(2),(5)
	T. Uniformity	$\Delta T$	-	10	°C	
Shock ( non - operating )		$S_{nop}$	-	50	G	(3)
Vibration ( non - operating )		$V_{nop}$	-	1.5	G	(4)

Note (1)  $T_a = 25 \pm 2^\circ\text{C}$

(2) Temperature and relative humidity range are shown in the figure below.

a. 90 % RH Max. ( $T_a \leq 39^\circ\text{C}$ )

b. Relative Humidity is 90% or less. ( $T_a > 39^\circ\text{C}$ )

c. No condensation

(3) 11ms, sine wave, one time for  $\pm X$ ,  $\pm Y$ ,  $\pm Z$  axis

(4) 10-300 Hz, Sweep rate 10min, 30min for X,Y,Z axis

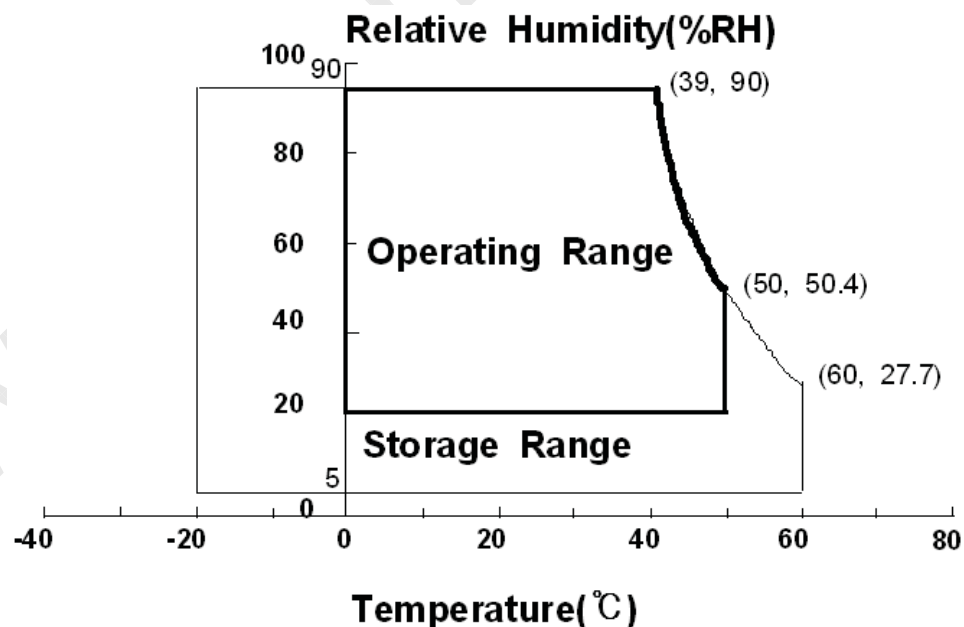
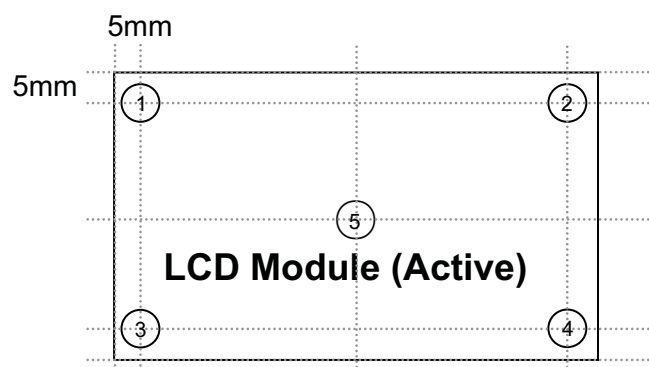


Fig. Temperature and Relative humidity range

(5) Definition of test point



$\Delta T$  should be less than  $10\text{ }^{\circ}\text{C}$  ( $\Delta T = |T_{\text{OPR}} - T_{\text{MAX}}|$ )

$T_{\text{OPR}}$  : Temperature of the center of the glass surface (Test point 5)

$T_1 \sim T_4$  : Temperature of each edge of the glass surface

$T_{\text{MAX}}$  : The highest temperature of the glass surface

## 2. Optical Characteristics

The optical characteristics should be measured in a dark room or equivalent.

Measuring equipment : TOPCON BM-5A, BM-7, Photo Research PR650

(Ta = 25 ± 2°C, VDD=12.0V, fv= 120Hz, f<sub>DCLK</sub>=160MHz, I<sub>L</sub> = 8.0mA )

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio (Center of screen)		C/R	Normal $\theta_{L,R}=0$ $\theta_{U,D}=0$  Viewing Angle	1200	2000	-		(3) BM-5A
Response Time	Rising	Tr		-	TBD	-	Msec	(5) BM-7
	Falling	Tf		-	TBD	-		
	G-to-G	Tg		-	6	-		
Luminance of White (Center of screen)		Y <sub>L</sub>		400	500	-	cd/m <sup>2</sup>	(6) BM-5A
Color Chromaticity (CIE 1931)	Red	Rx		TYP. -0.03	0.643	TYP. +0.03		(7),(8) PR650
		Ry			0.331			
	Green	Gx			0.281			
		Gy			0.596			
	Blue	Bx			0.144			
		By			0.061			
	White	Wx			0.280			
		Wy			0.290			
Color Gamut		-	-	72	-	%	(7) PR650	
Color Temperature		-	-	10000	-	K		
Viewing Angle	Hor.	$\theta_L$	C/R≥10	75	89	-	Degree	(8) BM-5A
		$\theta_R$		75	89	-		
	Ver.	$\theta_U$		75	89	-		
		$\theta_D$		75	89	-		
Brightness Uniformity (9 Points)		B <sub>uni</sub>		-	-	25	%	(4) BM-5A

### Note (1) Test Equipment Setup

The measurement should be executed in a stable, windless and dark room between 40min and 60min after lighting the back light at the given temperature for stabilization of the back light. This should be measured in the center of screen.

Lamp current : 8.0mA

Environment condition : Ta = 25 ± 2 °C

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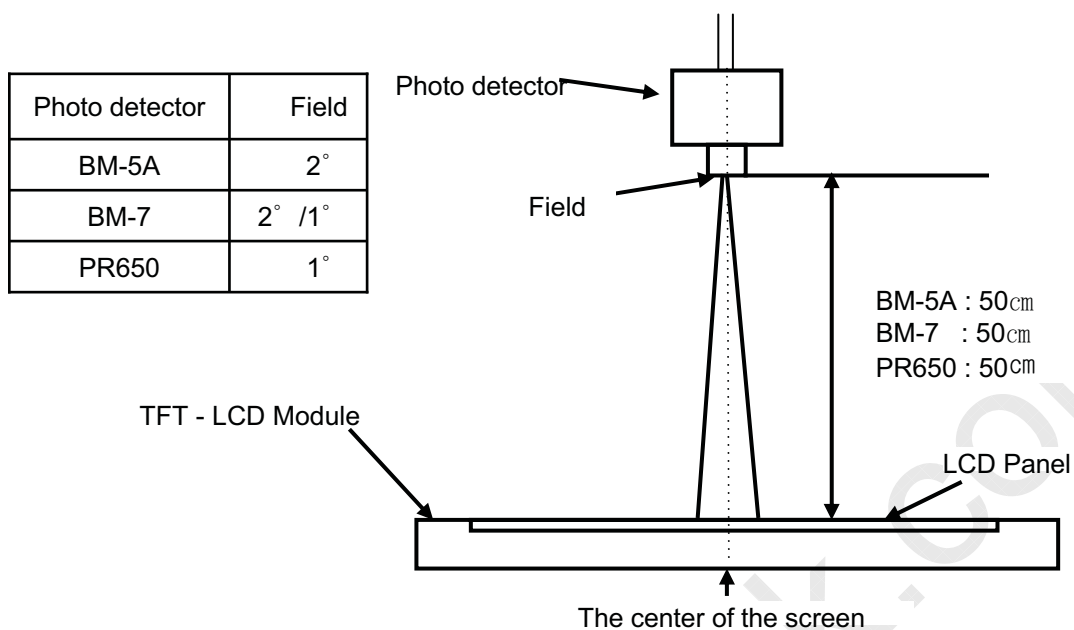
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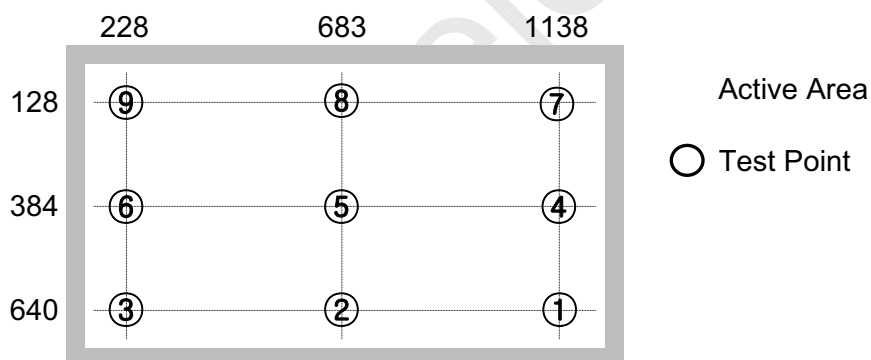
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Note (2) Definition of test point



Note (3) Definition of Contrast Ratio (C/R)

: Ratio of gray max (Gmax) & gray min (Gmin) at the center point ⑤ of the panel

$$C/R = \frac{G_{\max}}{G_{\min}}$$

Gmax : Luminance with all pixels white

Gmin : Luminance with all pixels black

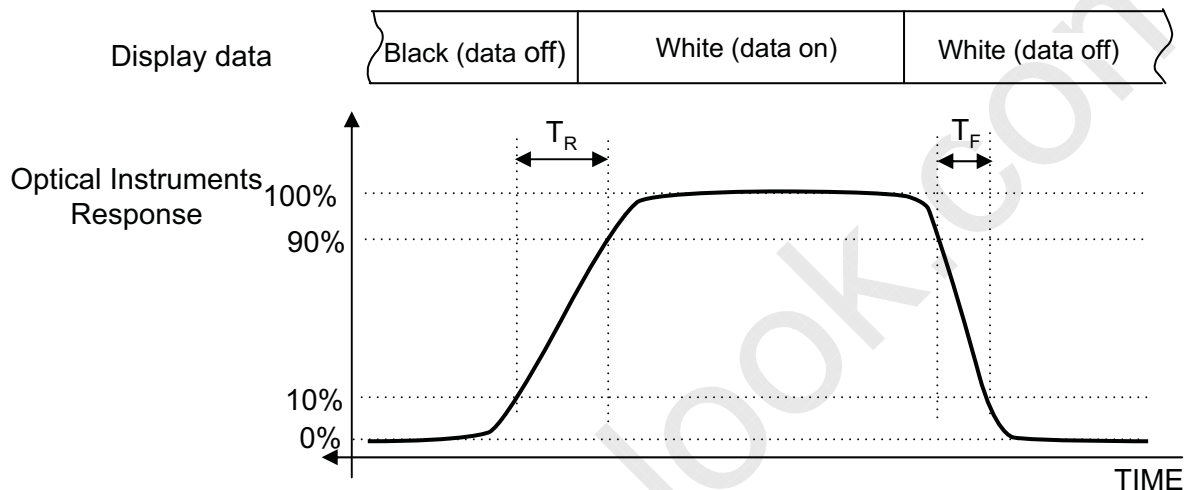
Note (4) Definition of 9 points brightness uniformity

$$B_{uni} = 100 * \frac{(B_{max} - B_{min})}{B_{max}}$$

B<sub>max</sub> : Maximum brightness

B<sub>min</sub> : Minimum brightness

Note (5) Definition of Response time : Sum of T<sub>r</sub>, T<sub>f</sub>



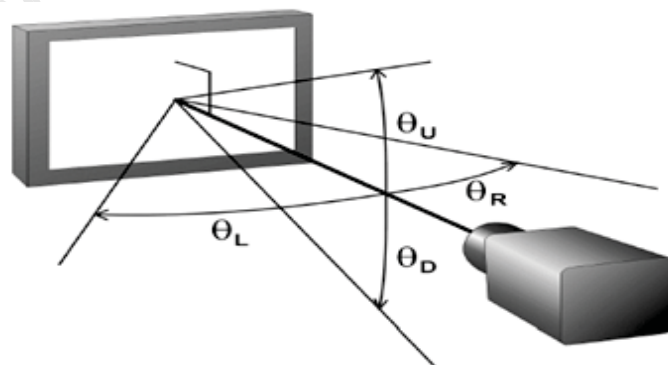
Note (6) Definition of Luminance of White : Luminance of white at center point ⑤

Note (7) Definition of Color Chromaticity (CIE 1931)

Color coordinate of Red, Green, Blue & White at center point ⑤

Note (8) Definition of Viewing Angle

: Viewing angle range (C/R ≥ 10)





### 3.2 Back Light Unit

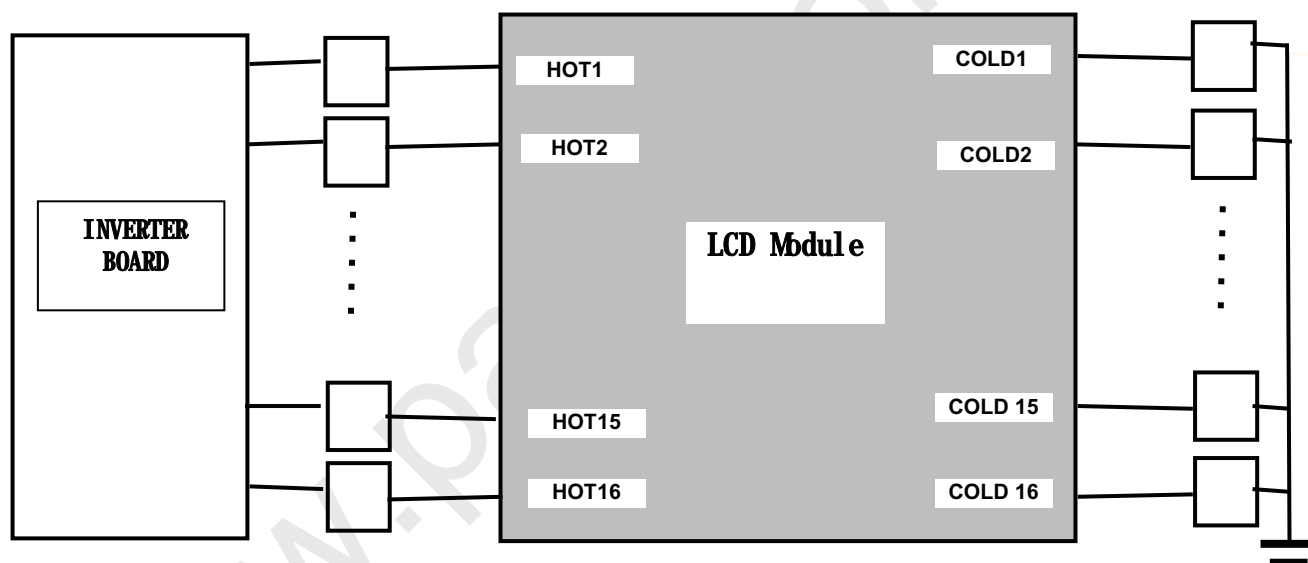
The back light unit contains 16 direct-lighting type CCFTs ( Cold Cathode Fluorescent Tube ). The characteristics of lamps are shown in the following tables.

$T_a = 25 \pm 2^\circ\text{C}$

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Lamp Current	$I_L$	3.0	-	7.5	mArms	
Lamp Voltage	$V_L$	1365	-	1500	Vrms	
Operating Life Time	Hr	50,000	-	-	Hour	(1)

Note (1) It is defined as the time to take until the brightness reduces to 50% of its original value.

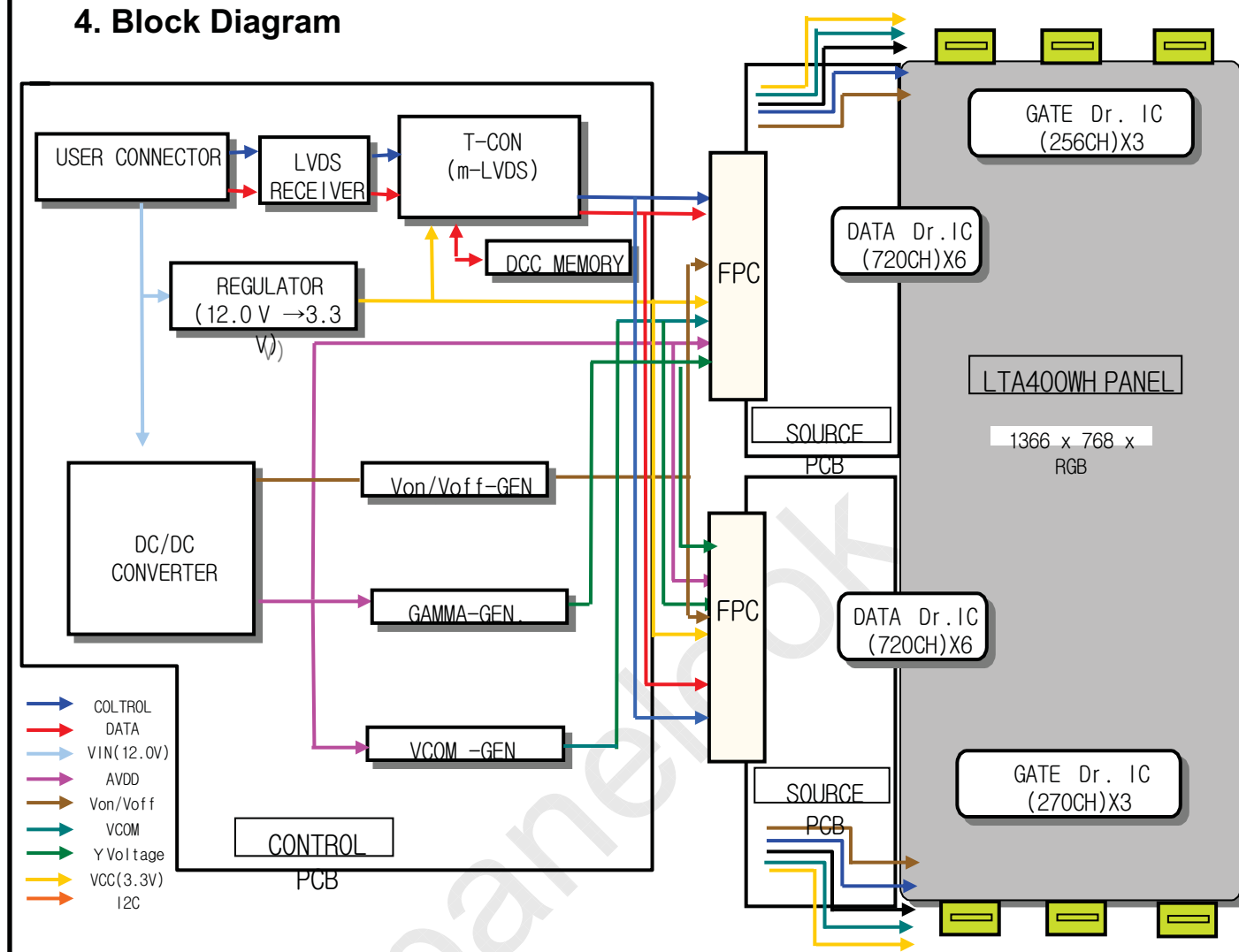
[Operating condition :  $T_a = 25 \pm 2^\circ\text{C}$ , For single lamp only. ]



### 3.3 Inverter Input Condition & Specification

Items	Symbol	Conditions	Specifications			Unit	Note
			Min.	Typ.	Max.		
Input Voltage	V <sub>in</sub>	-	23.0	24.0	25.0	V	Ta=25±2 °C
Input Current	I <sub>RUSH</sub>	V <sub>in</sub> =24.0V V <sub>dim</sub> =3.3V	-	-	10	A	Initial Turn-on
Lamp Current	I <sub>O</sub>	V <sub>dim</sub> =3.3 V	7.3	8.0	8.3	mArms	-
Frequency	F <sub>LAMP</sub>	V <sub>in</sub> =24.0 V	38	43	48	kHz	-
Backlight On/Off	ON	V <sub>in</sub> =24.0 V	2.4	-	5.25	V	-
	OFF	V <sub>in</sub> =24.0 V	0	-	0.8		
Dimming Control	V <sub>DIM</sub>	Max Lum	3.3	-	-	V	-
		Min. Lum	-	-	0		

## 4. Block Diagram





## 5. Input Terminal Pin Assignment

### 5.1. Input Signal & Power

Connector : FI-RE51S-HF (JAE)

Pin	Symbol	Description	Pin	Symbol	Description
1	Power	DC 12V	26	RE[0]P	Even LVDS Signal +
2	Power	DC 12V	27	RE[1]N	Even LVDS Signal -
3	Power	DC 12V	28	RE[1]P	Even LVDS Signal +
4	Power	DC 12V	29	RE[2]N	Even LVDS Signal -
5	Power	DC 12V	30	RE[2]P	Even LVDS Signal +
6	GND	GND	31	GND	GND
7	GND	GND	32	RECLK-	Even LVDS Signal -
8	GND	GND	33	RECLK+	Even LVDS Signal +
9	GND	GND	34	GND	GND
10	RO[0]N	Odd LVDS Signal -	35	RE[3]N	Even LVDS Signal -
11	RO[0]P	Odd LVDS Signal +	36	RE[3]P	Even LVDS Signal +
12	RO[1]N	Odd LVDS Signal -	37	RE[4]N	No Connection
13	RO[1]P	Odd LVDS Signal +	38	RE[4]P	No Connection
14	RO[2]N	Odd LVDS Signal -	39	GND	GND
15	RO[2]P	Odd LVDS Signal +	40	NC	No Connection
16	GND	GND	41	NC	No Connection
17	ROCLK-	Odd LVDS Signal -	42	NC	No Connection
18	ROCLK+	Odd LVDS Signal +	43	NC	No Connection
19	GND	GND	44	NC	No Connection
20	RO[3]N	Odd LVDS Signal -	45	NC	No Connection
21	RO[3]P	Odd LVDS Signal +	46	NC	No Connection
22	RO[4]N	No Connection	47	NC	No Connection
23	RO[4]P	No Connection	48	NC	No Connection
24	GND	GND	49	NC	No Connection
25	RE[0]N	Even LVDS Signal -	50	NC	No Connection
			51	NC	No Connection

Note (1) No Connection: This PINS are only used for SAMSUNG internal using.

SEQUENCE : On =  $V_{DD}(T1) \geq \text{LVDS Option} \geq \text{Interface Signal}(T2)$   
OFF =  $\text{Interface Signal}(T3) \geq \text{LVDS Option} \geq V_{DD}$

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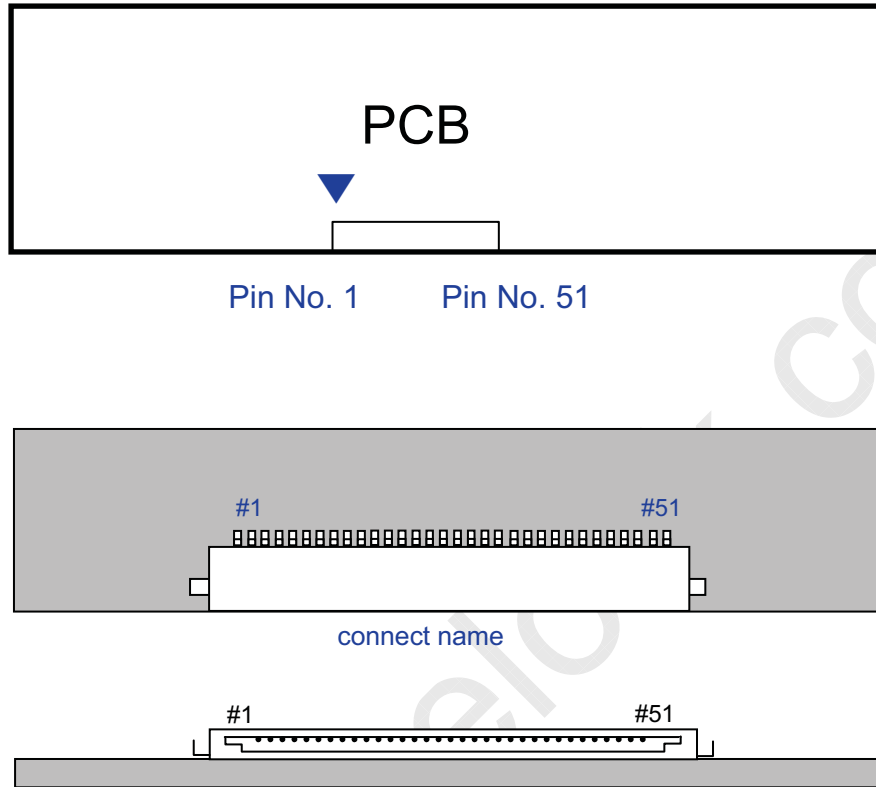
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Note(1) Pin number starts from Right side



**Fig. Connector diagram**

- a. All GND pins should be connected together and also be connected to the LCD's metal chassis.
- b. All power input pins should be connected together.
- c. All NC pins should be separated from other signal or power.

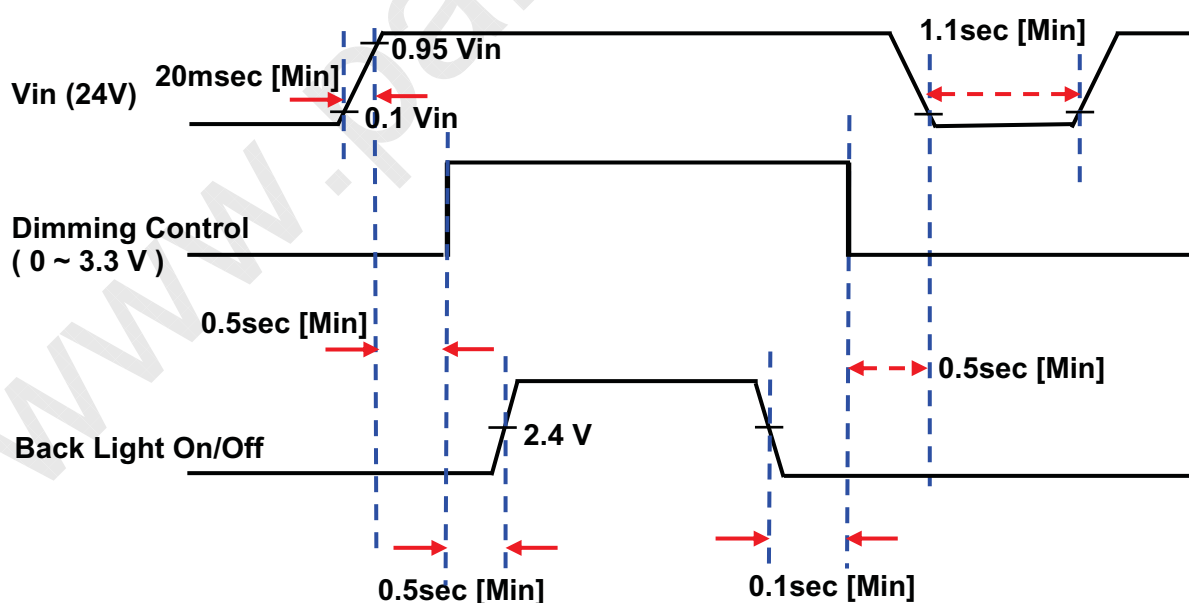


## 5.2. Inverter Input Pin Configuration

Connector : S14B-PHA-SM-TB(LF) (JST)

Pin No.	Pin Configuration(FUNCTION)
1	24 V
2	24 V
3	24 V
4	24 V
5	24 V
6	GND
7	GND
8	GND
9	GND
10	GND
11	No Connection
12	Backlight On /Off [ON:2.4 - 5.25 V, OFF: 0 - 0.8 V]
13	Dimming Control [0V:Min, 3.3V:Max]
14	No Connection

## 5.3. Inverter Input Power Sequence



#### 5.4 LVDS Interface

- LVDS Receiver : THC63LVD104A
- Data Format (JEIDA)

	LVDS pin	JEIDA -DATA
TxOUT/RxIN0	TxIN/RxOUT0	R2
	TxIN/RxOUT1	R3
	TxIN/RxOUT2	R4
	TxIN/RxOUT3	R5
	TxIN/RxOUT4	R6
	TxIN/RxOUT6	R7
	TxIN/RxOUT7	G2
TxOUT/RxIN1	TxIN/RxOUT8	G3
	TxIN/RxOUT9	G4
	TxIN/RxOUT12	G5
	TxIN/RxOUT13	G6
	TxIN/RxOUT14	G7
	TxIN/RxOUT15	B2
	TxIN/RxOUT18	B3
TxOUT/RxIN2	TxIN/RxOUT19	B4
	TxIN/RxOUT20	B5
	TxIN/RxOUT21	B6
	TxIN/RxOUT22	B7
	TxIN/RxOUT24	HSYNC
	TxIN/RxOUT25	VSYNC
	TxIN/RxOUT26	DEN
TxOUT/RxIN3	TxIN/RxOUT27	R0
	TxIN/RxOUT5	R1
	TxIN/RxOUT10	G0
	TxIN/RxOUT11	G1
	TxIN/RxOUT16	B0
	TxIN/RxOUT17	B1
	TxIN/RxOUT23	RESERVED

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## 5.5 Input Signals, Basic Display Colors and Gray Scale of Each Color

COLOR	DISPLAY (8bit)	DATA SIGNAL																												GRAY SCALE LEVEL
		RED								GREEN								BLUE												
		R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7					
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-		
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	-			
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	-			
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-			
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-			
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	-			
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	-			
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-			
GRAY SCALE OF RED	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0			
	DARK ↑	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1			
		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:				R3~ R252			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:							
	↓ LIGHT	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R252			
		0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R252			
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R252			
GRAY SCALE OF GREEN	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0			
	DARK ↑	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G1			
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G2			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:				G3~ G252			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:							
	↓ LIGHT	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	G252			
		0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	G252			
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	G252			
GRAY SCALE OF BLUE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0			
	DARK ↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	B1			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B2			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:				B3~ B252			
		:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:							
	↓ LIGHT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	B252			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	B252			
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	B252			

Note) Definition of Gray :

Rn : Red Gray, Gn : Green Gray, Bn : Blue Gray (n = Gray level)

Input Signal : 0 = Low level voltage, 1 = High level voltage

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## 6. Interface Timing

### 6.1 Timing Parameters ( DE only mode )

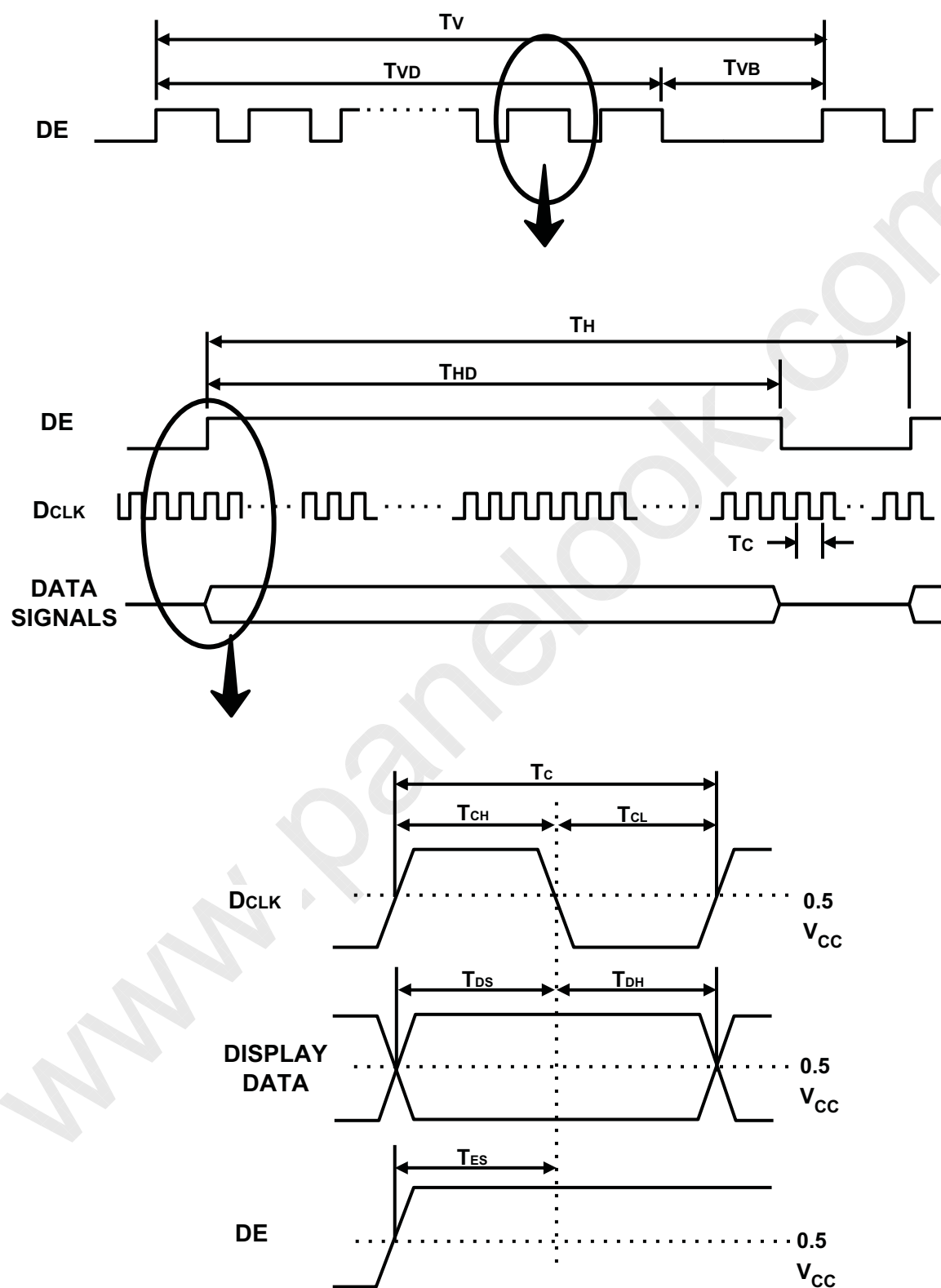
SIGNAL	ITEM	SYMBOL	MIN.	TYP.	MAX.	Unit	NOTE
Clock	Frequency	$1/T_C$	55	80	82	MHz	-
Hsync		$F_H$	65	96.6	98	KHz	-
Vsync		$F_V$	85	120.0	125	Hz	-
Vertical Display Term	Active Display Period	$T_{VD}$	-	768	-	Lines	-
	Vertical Total	$T_{VB}$	790	806	1500	Lines	-
Horizontal Display Term	Active Display Period	$T_{HD}$	-	1366	-	Clocks	-
	Horizontal Total	$T_H$	1450	1600	1800	clocks	-

Note) This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

(1) Test Point : TTL control signal and CLK at LVDS Tx input terminal in system

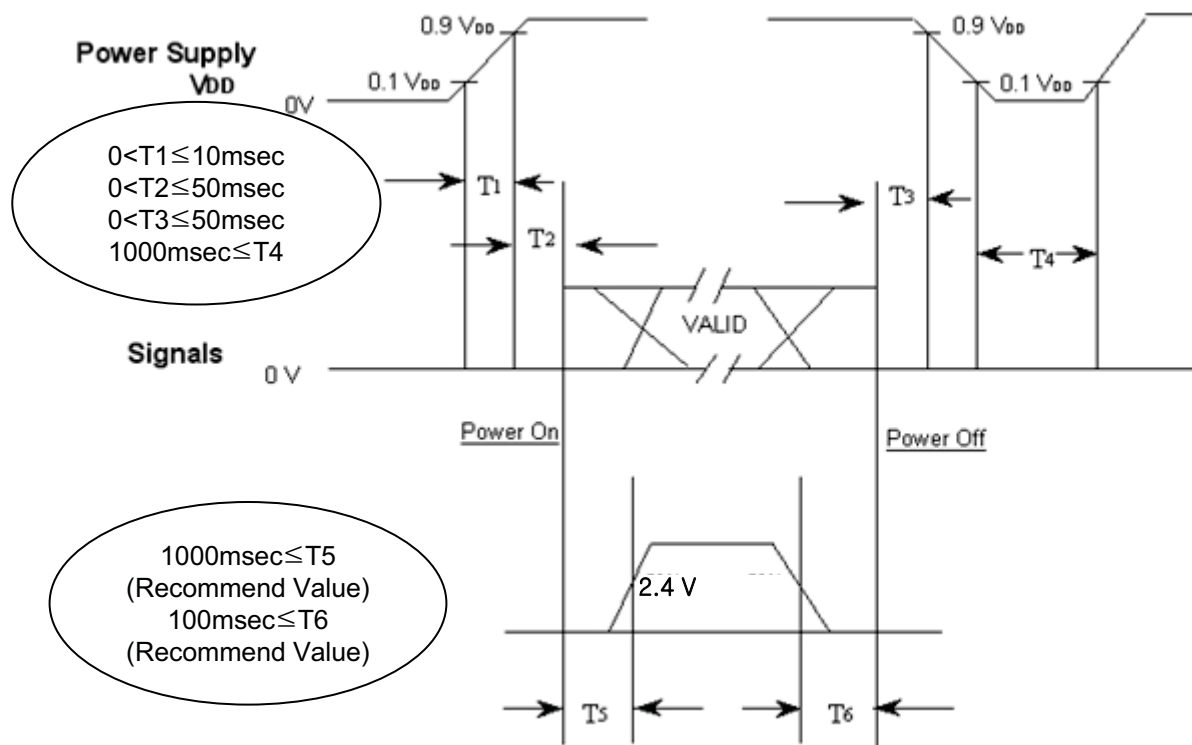
(2) Internal  $V_{DD} = 3.3V$

## 6.2 Timing diagrams of interface signal ( DE only mode )



### 6.3 Power ON/OFF Sequence

To prevent a latch-up or DC operation of the LCD Module, the power on/off sequence should be as the diagram below.



T1 : V<sub>DD</sub> rising time from 10% to 90%

T2 : The time from V<sub>DD</sub> to valid data at power ON.

T3 : The time from valid data off to V<sub>DD</sub> off at power Off.

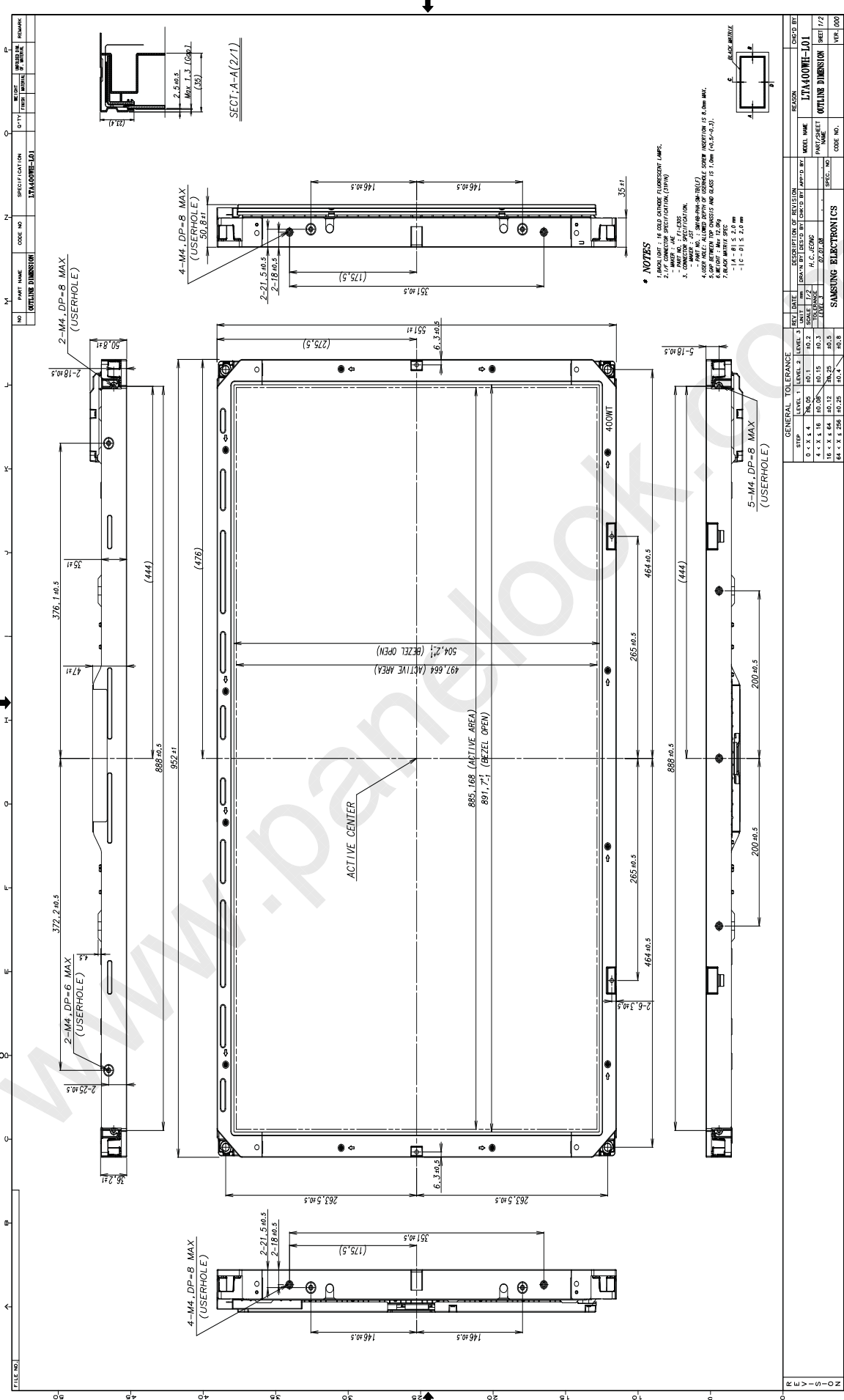
T4 : V<sub>DD</sub> off time for Windows restart

T5 : The time from valid data to B/L enable at power ON.

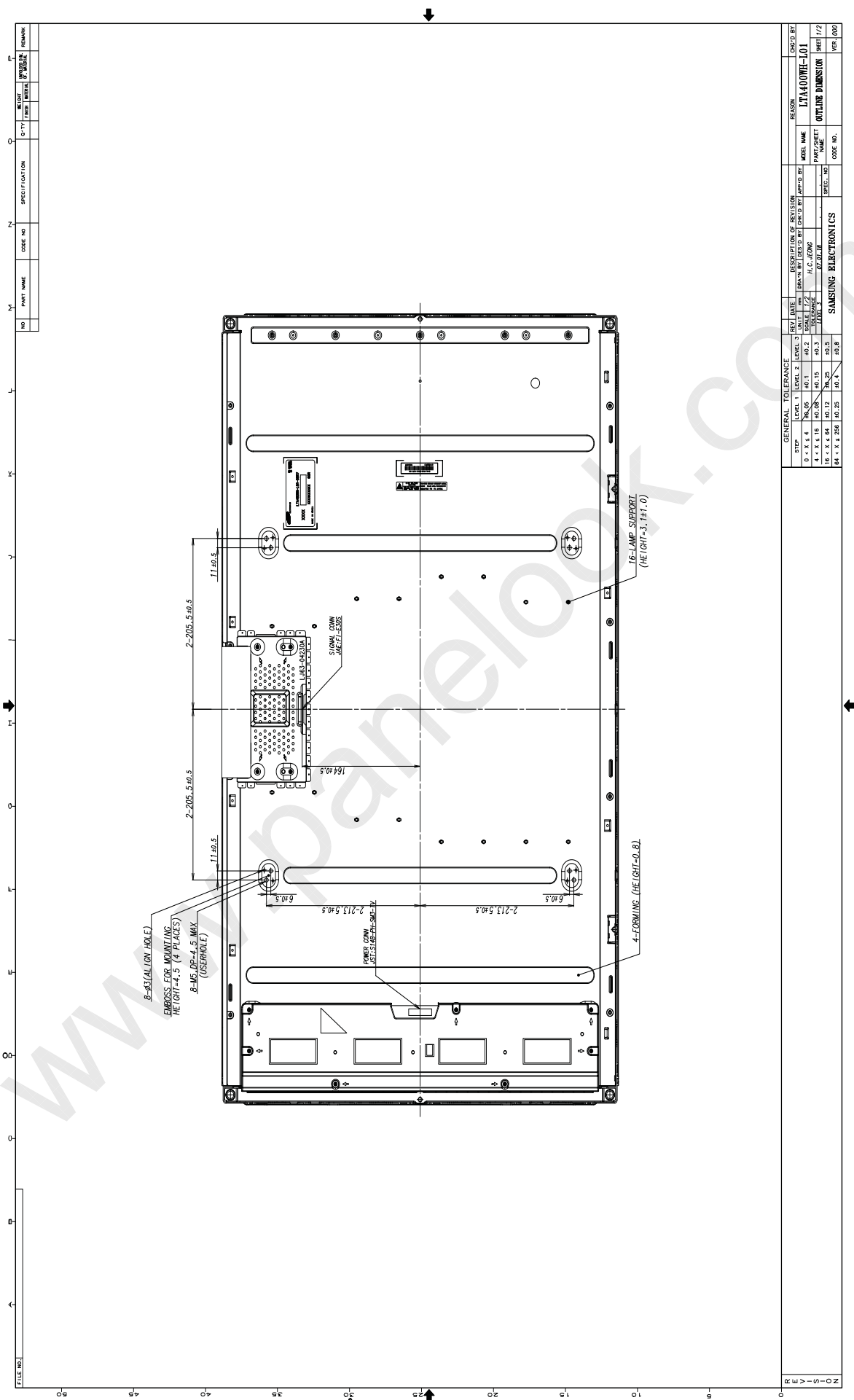
T6 : The time from valid data off to B/L disable at power Off.

- The supply voltage of the external system for the Module input should be the same as the definition of V<sub>DD</sub>.
- Apply the lamp voltage within the LCD operation range. When the back light turns on before the LCD operation or the LCD turns off before the back light turns off, the display may momentarily show abnormal screen.
- In case of V<sub>DD</sub> = off level, please keep the level of input signals low or keep a high impedance.
- T4 should be measured after the Module has been fully discharged between power off and on period.
- Interface signal should not be kept at high impedance when the power is on.

7. Outline Dimension (Front View)



## 7. Outline Dimension (Rear View)

[illegible]



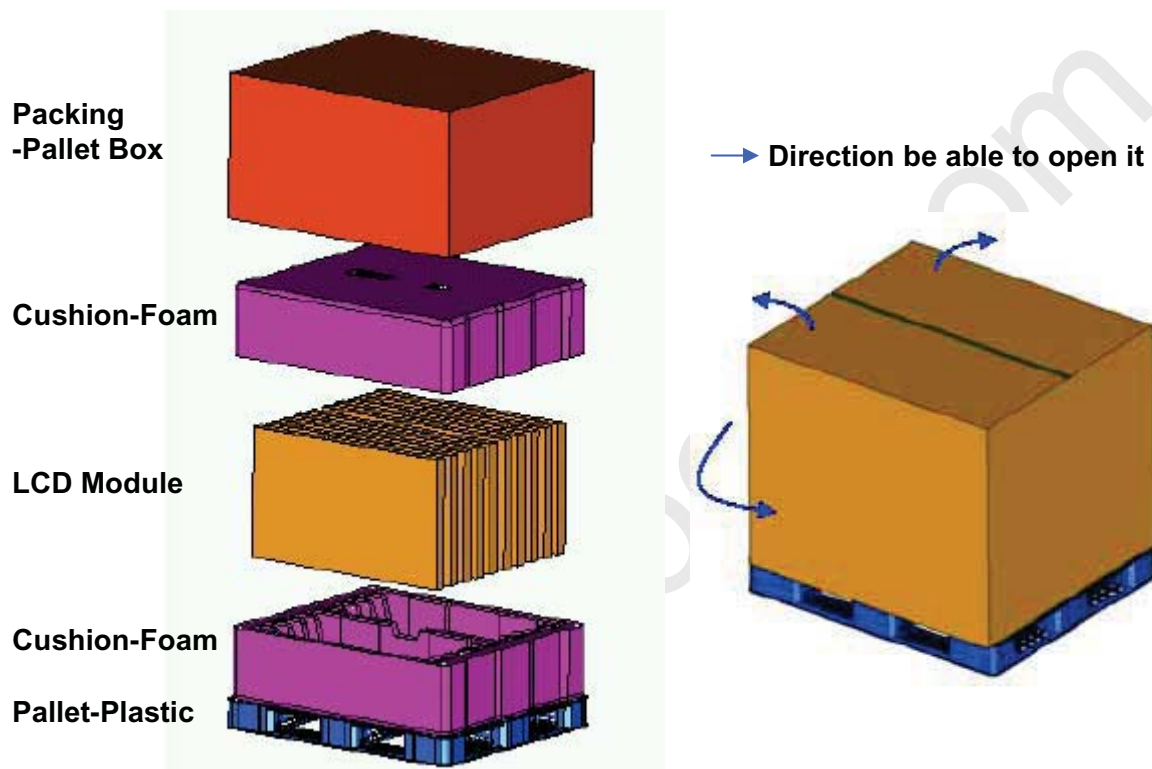
## 8. PACKING

### 8.1 CARTON (Internal Package)

#### (1) Packing Form

Corrugated fiberboard box and corrugated cardboard as shock absorber

#### (2) Packing Method



### 8.2 Packing Specification

Item	Specification	Remark
LCD Packing	10ea / (Packing-Pallet Box)	1. 105 Kg / LCD (10ea) 2. 7 Kg / Cushion-pallet (2ea) 3. 6.7 Kg / Packing-Pallet Box (1ea) 4. Cushion-pallet Material : EPS 5. Packing-Pallet Box Material : DW4
Pallet	1Box / Pallet	1. Pallet weight = 8kg 2. 8Kg/Pallet
Packing Direction	Vertical	
Total Pallet Size	H x V x height	1150mm(H) x 985mm(V) x 609mm(height)
Total Pallet Weight	126.7kg	Pallet(8kg) + Module(10.5*10=105) + Cushion(up+bottom=7kg) + Pallet-BOX(6.7kg)

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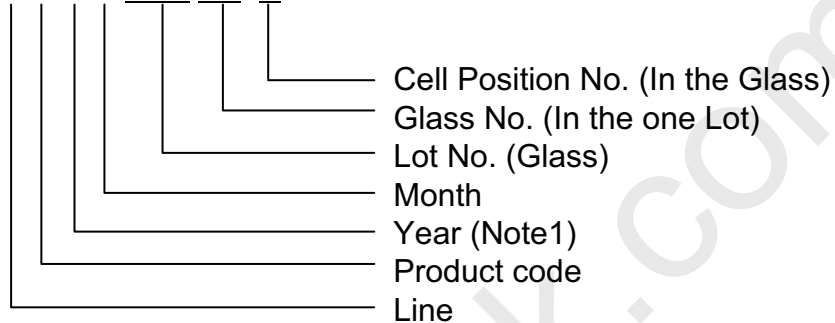
## 9. MARKING & OTHERS

A nameplate bearing followed by is affixed to a shipped product at the specified location on each product.

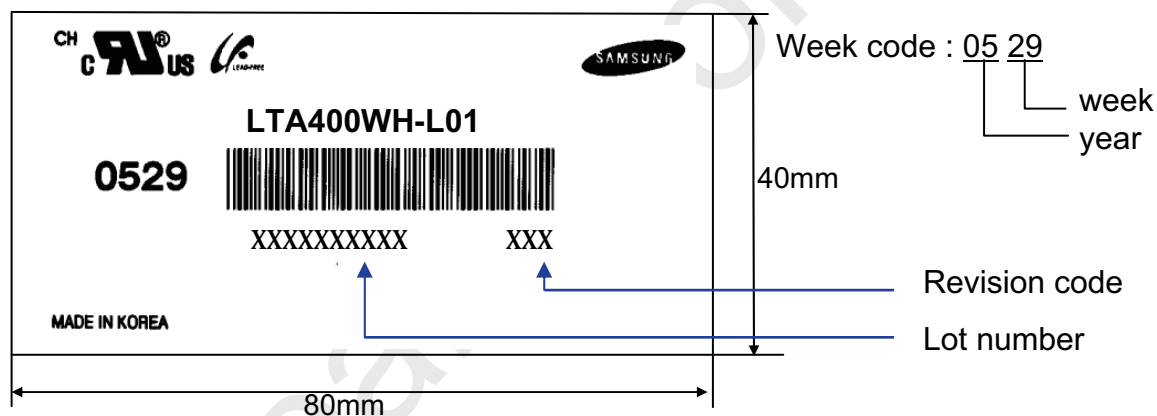
(1) Part number : LTA400WH-L01

(2) Revision: Three letters

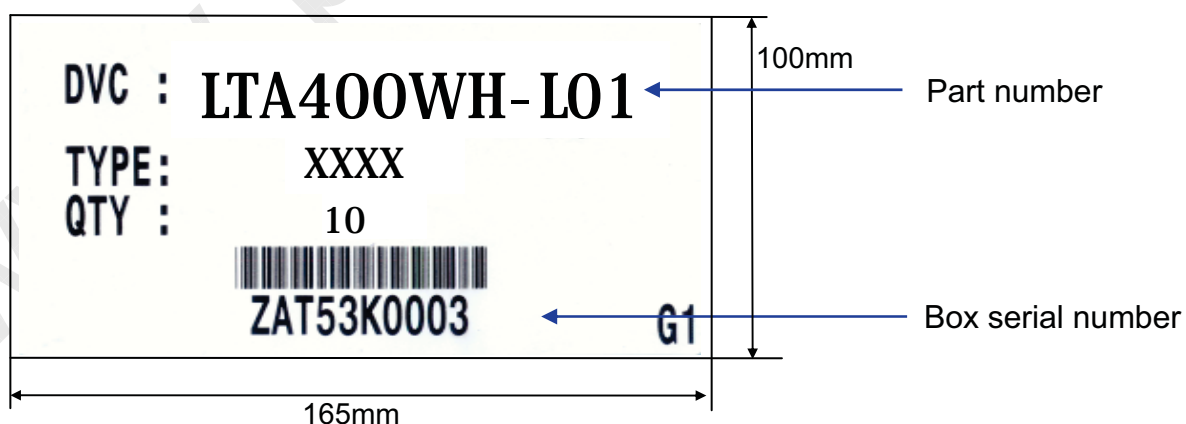
(3) Lot number : X X X X XXX XX X



(4) Nameplate Indication



(5) Packing box attach



(6) Others

1. After service part

Lamps cannot be replaced because of the narrow bezel structure.

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## 10. General Precautions

### 10.1 Handling

- (a) When the Module is assembled, it should be attached to the system firmly using all mounting holes. Be careful not to twist and bend the Module.
- (b) Because the inverter use high voltage, it should be disconnected from power before it is assembled or disassembled.
- (c) Refrain from strong mechanical shock and / or any force to the Module.  
In addition to damage, this may cause improper operation or damage to the Module and CCFT back light.
- (d) Note that polarizers are very fragile and could be damage easily.  
Do not press or scratch the surface harder than a HB pencil lead.
- (e) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining or discoloration may occur.
- (f) If the surface of the polarizer is dirty, clean it using absorbent cotton or soft cloth.
- (g) Desirable cleaners are water, IPA(Isopropyl Alcohol) or Hexane.  
Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
- (h) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth . In case of contact with hands, legs or clothes, it must be washed away with soap thoroughly.
- (i) Protect the Module from static, or the CMOS Gate Array IC would be damaged.
- (j) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (k) Do not disassemble the Module.
- (l) Do not pull or fold the lamp wire.
- (m) Do not adjust the variable resistor located on the Module.
- (n) Protection film for polarizer on the Module should be slowly peeled off just before use so that the electrostatic charge can be minimized.
- (o) Pins of I/F connector should not be touched directly with bare hands.

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## 10.2 Storage

- (a) Do not leave the Module in high temperature, and high humidity for a long time. It is highly recommended to store the Module with temperature from 0 to 35℃ and relative humidity of less than 70%.
- (b) Do not store the TFT-LCD Module in direct sunlight.
- (c) The Module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light in storing.

## 10.3 Operation

- (a) Do not connect or disconnect the Module in the "Power On" condition.
- (b) Power supply should always be turned on/off by the "Power on/off sequence"
- (c) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (d) The cable between the back light connector and its inverter power supply should be connected directly with a minimized length. A longer cable between the back light and the inverter may cause lower luminance of lamp(CCFT) and may require higher startup voltage(Vs).

## 10.4 Operation Condition Guide

- (a) The LCD product should be operated under normal conditions.  
Normal condition is defined as below;
  - Temperature :  $20 \pm 15^{\circ}\text{C}$
  - Humidity :  $55 \pm 20\%$
  - Display pattern : continually changing pattern (Not stationary)
- (b) If the product will be used in extreme conditions such as high temperature, humidity, display patterns or operation time etc., It is strongly recommended to contact SEC for Application engineering advice. Otherwise, its reliability and function may not be guaranteed. Extreme conditions are commonly found at Airports, Transit Stations, Banks, Stock market, and Controlling systems.



## 10.5 Others

- (a) Ultra-violet ray filter is necessary for outdoor operation.
- (b) Avoid condensation of water. It may result in improper operation or disconnection of electrode.
- (c) Do not exceed the absolute maximum rating value. ( supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on)  
Otherwise the Module may be damaged.
- (d) If the Module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen.  
To avoid image sticking, it is recommended to use a screen saver.
- (e) This Module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.
- (f) Please contact SEC in advance when you display the same pattern for a long time.